

WATER QUALITY IN OUR UNIQUE VIRGIN ISLANDS ENVIRONMENT

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by May Adams Cornwall
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What Water Quality?

- Cistern Water Quality
- Ground Water Quality
- Surface Water Quality



Local Research Entities

- University of the Virgin Islands
- Department of Planning and Natural Resources
- Department of Health
- Non-governmental Organizations
- Private Water Laboratories



Cistern Water Quality Concerns

- Bacteria in un-chlorinated cisterns
- Formation of THMs in chlorinated cisterns
- Airborne pollutants and deposits on roofs
- Roof and cistern construction materials



Existing Cistern Water Research

- Residential, public housing, hotels, resorts
- Chlorination not routinely practiced
- High densities of different types of bacteria
- *Pseudomonas aeruginosa* present in the absence of coliform; supplemental testing
- Environmental origin



Research Recommendations

- Regular chlorination practices
- Supplemental testing for *Pseudomonas*
- Remove debris, silt, sludge
- Cut overhang from roof collection area and screen openings
- Extend potable water distribution system



Past Research Focus

- Pure research value – correlations between indicators; economic and effective isolation of organisms
- Establish standards – laboratory and field testing
- Establish practices – operations and maintenance
- Support potable water system expansion



New Research Focus

- Chlorination in Cisterns
- Disinfection By-Products
- Roof construction materials
- Cistern construction materials
- Air pollutant deposits on roofs



Research Cases and Candidates

- Joseph Sibilly School Annex
- Hotel – unnamed
- Bovoni Housing Community
- Nadir Housing Community
- Estates Profit and Clifton Hill



Ground Water Quality Concerns

- Private residential or commercial wells
- Bacteria - sewage/septage spills
- Nitrate/nitrite -farming activities
- Hydrocarbons - oil spill
- VOCs – landfill leachate
- Heavy Metals - landfill leachate



Existing Ground Water Research

- Geochemical Modeling of wells in limestone region
 - High Chlorides, Sulfates, Sodium
- Reconnaissance of ground water study
 - High coliforms
 - Fecal coliforms present
 - Nitrates exceeded standard



New Research Focus

- Cumulative Risk Assessment
 - Health Correlations
 - Farming Activities – Food Chain



Research Cases and Candidates

- Tutu Aquifer
- Kingshill Aquifer



Surface Water Quality Concerns

- Sedimentation
- Sewage/septage spills
- Rum discharges



Existing Surface Water Research

- TMDL 303(d) list
- Mangrove Lagoon and Benner Bay
- V.I. Rum Industries Discharge



Present Research Focus

- Compliance Monitoring and Assessment
- Discharge Permit Requirements



New Research Focus

- Epidemiological studies
- Health correlations
- Fish and marine life pathology
- Water intake and desalination process



Research Cases and Candidates

- Meningitis
- Legionnaire's Disease
- Cold and viruses
- Negro Bay
- Mogens Bay
- Hull Bay
- Christiansted Harbor



Barriers or Opportunities?

- Strategic Planning-Crosscutting Programs
- Interagency Cooperative Agreements
- University Graduate Science Research
- Grants & Other Research Funding
- Community Outreach and Education
- Community Participation
- Privacy Laws



Community Based Participatory Research

- Community Subjects
- Community Volunteers
- Community Actors



CBPR Subjects

- Permission and buy in
- Input and feedback
- Health and other history
- Long term tracking
- Cumulative Risk Assessment



CBPR Volunteers

- Data Collection
- Surveys – Relationships
- Analysis – Capacity Building
- Self-Monitoring – Follow Up
- Correlations - Health



CBPR Actors

- Change Agents – government, residents, businesses, hotels, industries
- New process or technology
- Modify operation & maintenance requirements
- Substitute chemicals or supplies
- Best Management Practices



Community Advantages

- Educated and informed
- Health information
- Target group database
- Long term feedback
- Decision-making
- Funding & corrective action
- Community support & action



New Research Outcomes

- Cistern chlorination and other treatment
- Disinfection By-Products (DBP) formation and removal
- Roof and cistern construction standards, materials, and specifications construction
- Epidemiology studies related to water quality – source and drinking



Action Outcomes

- Interagency Cooperative Agreements
- Create financial and technical assistance programs for data collection and analyses
- Develop statistics on water quality related health problems
- Correlation between water quality and health statistics
- Support research grant funding for water programs and projects to protect public and environmental health

